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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/008,810	11/13/2001	Debasis Majumdar	82857LMB	5670

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EXAMINER

WYROZEBSKI LEE, KATARZYNA I

ART UNIT PAPER NUMBER

1714

DATE MAILED: 09/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/008,810	<b>Applicant(s)</b> MAJUMDAR ET AL.	
	<b>Examiner</b> Katarzyna Wyrozebski Lee	<b>Art Unit</b> 1714	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-34, 37-45 and 48-51 is/are rejected.
- 7) ☒ Claim(s) 35, 36, 46 and 47 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All   b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                   | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                          | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>1101</u> | 6) <input type="checkbox"/> Other:  |

## **DETAILED ACTION**

### ***Specification***

1. The disclosure is objected to because of the following informalities: The specification of the present invention discloses information on co-pending applications on pages 1 and 20. The applicant is requested to fill in either the blank spaces or insert serial number instead of attorney's docket number. Appropriate correction is required.

### ***Claim Objections***

2. Claim 48, 49, 51 are objected to because of the following informalities: Claims 48, 49 and 51 contain limitation for group R1 wherein R1 is alkylene group and arylene group. With respect to the above claims, it is not clear as to how R1 can be two different types of monomers at the same time. Appropriate correction is required.

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*Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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6. Claims 1-34, 37-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over FISHER (US 6,579,927).

The prior art of FISHER discloses composition for nanocomposite material comprising block copolymer, clay and matrix copolymer.

The block copolymer of FISHER has block (A) compatible with the clay component and block (B) compatible with the matrix resin. According to specification of FISHER, block (A) is of hydrophilic nature and it includes polyethylene oxide (col. 3, lines 40-55). Number average molecular weight of the polyethylene oxide is in a range of 100-5,000 (claim 9).

Structural unit (B) is compatible with matrix polymer and can have the same monomers as the matrix polymer (col. 3, lines 61-66). Specification (col. 4, lines 10-15) discloses polyamides as one of the species of structural unit (B). The number average molecular weight of the polyamide would then be 100-20,000 (claim 9).

The polyether segment of the block or graft co-polymer of the prior art of FISHER has at least 2 monomeric units and polyamide segment has the same or larger amount of monomers as polyether segment. Specification further discloses that the segment (A) contains 5-20 monomeric units (col. 3, lines 56-60). Therefore the ratio between polyether segment and polyamide segment is in a range of 1:1 - 95:1 to 1:1 - 1:95.

The matrix polymer of the prior art of FISHER is selected from polyesters such as polyethylene terephthalate, polyamides, polyolefins such as polyethylene or polypropylene and the like (col. 3, lines 11-25), examples further teach polystyrene.

Clay component of the prior art of FISHER is smectite clay either natural or synthetic and it is selected from clays such as montmorillonite (col. 2, lines 42-54). Clay is utilized in an

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amount ratio of 0.01-1 to 100:1 with the block copolymer. The ratio of clay to matrix polymer is 1:200 to 2:1 (col. 4, lines 30-34). Based on the ratios depicted by the prior art of FISHER, the amount of matrix polymer is at least 50%.

In the process of the prior art of FISHER the clay component is first modified with block copolymer and mixed with suitable matrix polymer to form nanocomposite. Intercalation of the block component between the clay platelet is a well-known process, which occurs in this type of reaction and upon shearing action with matrix polymer such clay can further exfoliate (col. 4, lines 45-59). The examples further teach exfoliation, which further means that the clay had to be also intercalated beforehand.

Resulting composition has tensile modulus higher by 10 – 100 % (examples 1 and IV). Since the components of the prior art of FISHER overlap with the components of the present invention in both types of polymers and clays and the amounts, the limitation of the surface resistivity would also overlap.

The composition of the prior art of FISHER discloses PEO/PA block or graft copolymers intercalated in between the clay component and mixed with matrix polymer to form a moldable article.

In the light of the above discussion it would have been obvious for one having ordinary skill in the art at the time of the instant invention to utilize the prior art of FISHER as depicted in the rejection above and thereby obtain the claimed invention. The prior art of FISHER renders the present invention obvious because it teaches and thereby suggests using PEO and PA as block of one copolymer.



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7. Claims 48, 49, 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over FISHER (US 6,579,927) as applied to claims 1-34, 37-45, 48-51 above, and further in view of KURATSUJI (US 5,939,183).

The discussion of the disclosure of the prior art of FISHER from paragraph 6 of this office action is incorporated here by reference.

The difference between the present invention and the disclosure of the prior art of FISHER is explicit limitations of the polyamide polymers that can be utilized to make PEO/PA block copolymers.

With respect to the above difference, the prior art of KURATSUJI discloses PEO/PA block copolymer utilized in film forming.

The polyamide block is selected from monomers that are both aliphatic and aromatic (col. 1, lines 42-59).

Utilizing the polyamide made from the polymers of KURATSUJI allows one of ordinary skill in the art to form moldable and extrudable article.

In the light of the above disclosure, it would have been obvious to one having ordinary skill in the art at the time of the instant invention to utilize the PEO/PA copolymer of KURATSUJI and in the composition of FISHER and thereby obtain the claimed invention. Utilizing block copolymer of KURATSUJI would still result in moldable article as taught in FISHER.

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*Allowable Subject Matter*

8. Claims 35, 36, 46, 47 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of record does not teach or suggest making imaging or photographic articles from the disclosed compositions.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katarzyna Wyrozebski Lee whose telephone number is (703) 306-5875. The examiner can normally be reached on Mon-Thurs 6:30 AM-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (703) 306-2777. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

*Katarzyna Wyrozebski*

KIWL

August 27, 2003